



National Information Exchange Model

Practical Implementer's Course



United States
Department of Justice

Introduction to the NIEM Practical Implementer's Course



Practical Implementer's Course



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Overview

- Welcome
- Opening comments
- Introduction of presenters
- Agenda review
- Logistics
- Questions



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In This Section Students Will

- State what the National Information Exchange Model (NIEM) is and is not
- Problems the NIEM solves
- Learn about design, structure, and related components
- Explain the NIEM life cycle
- Learn what technical assistance and training resources are available for NIEM-based projects



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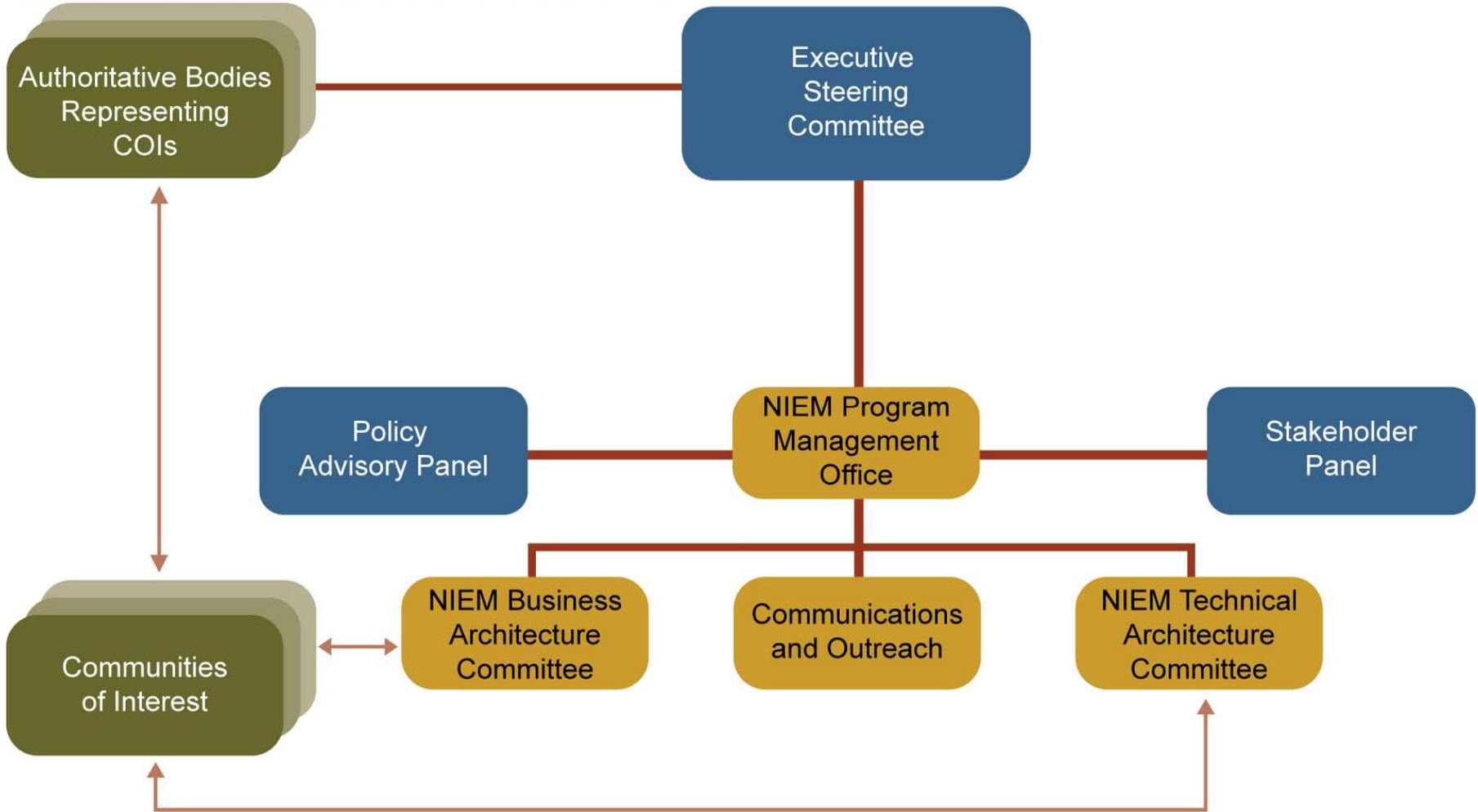


Vision for NIEM

- NIEM will be the standard, by choice, for government information exchange
- Scope is cross-government
- Business-driven focus on data layer interoperability
- Widespread reuse of information exchanges to reduce cost and improve interoperation
- Championing innovation in information exchange



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Representation on the NBAC

- Global Information Sharing Network
 - State, Local & Federal Law Enforcement
 - Corrections, Probation & Parole
 - Courts
- Industry
 - IJIS Institute
 - EIC Consortium
- Environmental Protection Agency
- U.S. Department of Homeland Security
 - Disaster Management
 - National Incident Management System
- OASIS
- Federal CIO Council
- Intelligence Community
- U.S. Department of Justice
- Emergency Services
 - Fire
 - EMS



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Overview of the NIEM



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What is the NIEM?

- The NIEM, or National Information Exchange Model, is a large-scale, object-oriented data model with extensive inheritance, instantiated as XML Schema; composed of reusable components (~4000 data elements and ~650 data types); and designed to facilitate disparate government and private entities in exchanging information quickly, accurately, and reliably



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What the NIEM REALLY is

- A data dictionary and reference model in the form of an XML Schema
- A framework that can be adapted/extended by local, state, tribal, and federal jurisdictions to support information sharing
- A work in progress
- Intentionally overinclusive



What the NIEM is NOT

- Database technology
- Just XML—it is a set of objects and their definitions
- Only Federal
 - Includes many other communities at all levels of government
- A programming language
- A silver bullet
- A replacement for exchanges and interagency agreements, which must still be defined
- A definition of interoperability (messaging, etc.)



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What Do You Need to Succeed With NIEM?

- Governance
- Tools
- Training
- Resources
- Follow best practices
 - NIEM
 - Software development
 - Domain-specific



NIEM Design

- Standards-based
- Structured data dictionary
 - Represented by XML Schema
- Object-oriented
 - Extension
 - Reuse
 - *Enables local additions of data components*
- Overinclusive and optional
- Requirements, solutions, and time constraints form rational compromises



Changes Accumulate

- Multiple version tracks maintained
 - Compatible changes are released in minor versions
 - Incompatible changes are accumulated for infrequent major releases
- This does not address governance of the Data Model
 - NBAC and NTAC determine when
 - Minor versions are released (frequently)
 - Major versions are released (infrequently)



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What Is an Exchange and Why Should I Care?

- Transferring information between two independent systems
- Examples from your community



Potential Barriers to Using the NIEM

- The NIEM is a big compromise—everyone will find one or more things they do not like about it
- Different from what many people are used to
- It is big and complex
- Limited tools, training, and understanding can be confusing
- Often seems more difficult than what you would come up with on your own to implement a particular exchange
- NIEM-specific tools are in their infancy
- NIEM learning curve may be inconsistent with project timeline and cost



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Several Resource Web Sites

- Resources for
 - Integration efforts
 - Integration profiles
 - Best practices
 - Funding approaches
 - System descriptions
 - Telecommunications approaches
 - Model integrated systems
- www.niem.gov
- NIEM Helpdesk
<http://it.ojp.gov/gjxdm/helpdesk>
- www.ijis.org



Technical Assistance Sources

- NC&OC (NIEM Communications & Outreach Committee)
 - NIEM Executive Briefing
 - NIEM Implementers Training
- National Information Sharing Standards Help Desk
- Technical Assistance
 - IACP/TTAP
 - IJIS Institute
 - NCSC
 - NGA
 - NLECTC
 - SEARCH



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NIEM Training

- Regional focus
- Class size of 40–100
- New format focused on
 - Basic knowledge of NIEM
 - Tools
 - Information exchanges



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NIEM Conformance

- DOJ Special Conditions Language
 - Requires conformance with the NIEM
- DHS Special Conditions Language
 - Mirrors the DOJ language
- DOJ-DHS Memorandum of Understanding
- Executive Order 13356, replaced by E.O. 13388 (October 25, 2005)
 - Establishes an Information Systems Council
 - Focus on information sharing and interoperable systems



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Semantic Conformance

- What do we mean by **conformance**?
 - Conformance means the ability to share accurate and reliable information using the NIEM such that the information has **the same** meaning for the sender as it does for the receiver



Technical Conformance

- Import and reference NIEM namespace or a correct subset
- If it exists, use the appropriate NIEM component (i.e., do not create a duplicate of one that exists)
- Be semantically consistent
 - Use NIEM components in accordance with their definitions
 - Do not use an element to represent data other than what its definition describes



Technical Conformance (continued)

- Apply XML Schema extension rules correctly and consistently
 - Naming and Design Rules (NDR)
- Exchanges conform, NOT systems
 - What you call data or how you use it in your own system does not impact conformance
 - What counts is how you package data as XML for exchange
- There is no concept of partial conformance



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National Information Exchange Model (NIEM)

Universal:

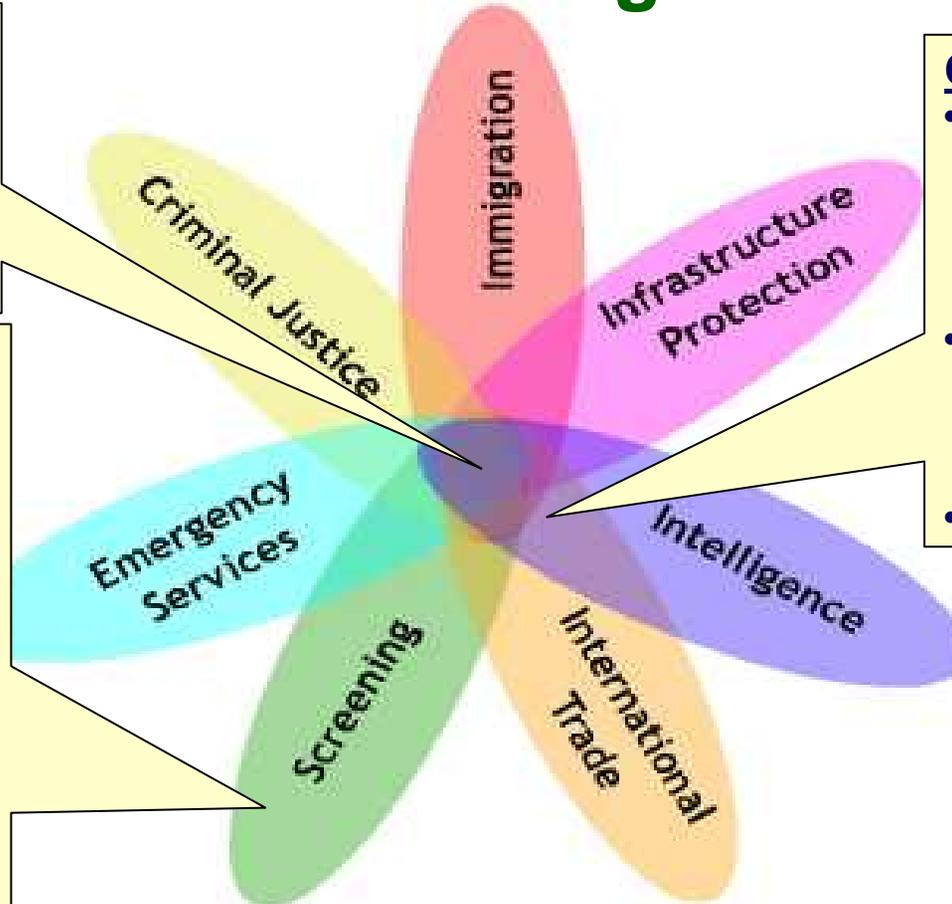
- Minimally supported set of items for all participating domains
- Universally understood
- Very stable

Domain Specific:

- Items with semantic meaning only in its domain
- Domain governing body:
 - Has representation on NBAC
 - Recommends content into domain or core via NBAC
 - Conforms to NIEM NDR
 - Follows NIEM governance policies & procedures

Common:

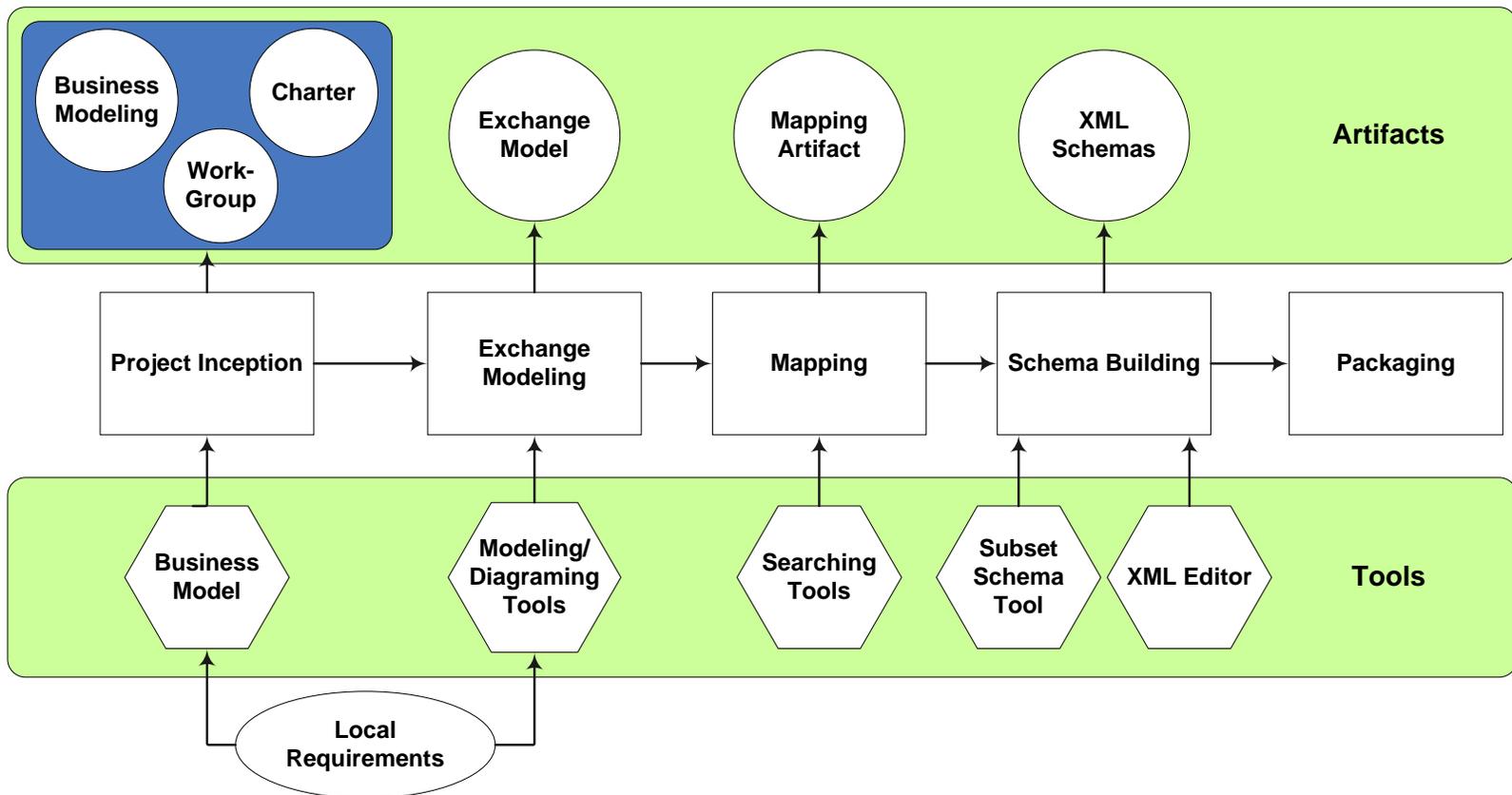
- Items with same semantic meaning shared across several domains
- With Universal, requires joint governance & reconciliation
- Relatively stable



Universal + Common = NIEM CORE



IEPD Development Lifecycle





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ENTERPRISE ARCHITECTURE: A FRAMEWORKTM



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	WHAT DATA	HOW FUNCTION	WHERE NETWORK	WHO PEOPLE	WHEN TIME	WHY MOTIVATION	
SCOPE (contextual)	List of Things Important to the Business Entity = Class of Business Thing	List of Processes the Business Performs Process = Class of Business Process	List of Locations in Which the Business Operates Node = Major Business Location	List of Organizations Important to the Business People = Major Organizational Unit	List of Events/Cycles Significant to the Business Time = Major Business Event/Cycle	Lists of Business Goals/Strategies Ends/Means = Major Business Goal/Strategy	SCOPE (contextual)
Planner							Planner
BUSINESS MODEL (conceptual)	e.g., Semantic Model Entity = Business Entity Relationship = Business Relationship	e.g., Business Process Model Process = Business Process I/O = Business Resources	e.g., Business Logistics System Node = Business Location Link = Business Linkage	e.g., Work Flow Model People = Organization Unit Work = Work Product	e.g., Master Schedule Time = Business Event Cycle = Business Cycle	e.g., Business Plan End = Business Objective Means = Business Strategy	BUSINESS MODEL (conceptual)
Owner							Owner
SYSTEM MODEL (logical)	e.g., Logical Data Model Entity = Data Entity Relationship = Data Relationship	e.g., Application Architecture Process = Application Function I/O = User Views	e.g., Distributed System Architecture Node = I/S Function (Processes, Storage, etc.) Link = Line Characteristics	e.g., Human Interface Architecture People = Role Work = Deliverable	e.g., Processing Structure Time = System Event Cycle = Processing Cycle	e.g., Business Rule Model End = Structural Assertion Means = Action Assertion	SYSTEM MODEL (logical)
Designer							Designer
TECHNOLOGY MODEL (physical)	e.g., Physical Data Model Entity = Segment/Table/etc. Relationship = Pointer/Key/etc.	e.g., System Design Process = Computer Function I/O = Data Elements/Sets	e.g., Technology Architecture Node = Hardware/Software Link = Line Specifications	e.g., Presentation Architecture People = User Work = Screen Formats	e.g., Control Structure Time = Execute Cycle = Component Cycle	e.g., Rule Design End = Condition Means = Action	TECHNOLOGY MODEL (physical)
Builder							Builder
DETAILED REPRESENTATIONS (out-of-context)	e.g., Data Definition Entity = Field Relationship = Address	e.g., Program Process = Language Statement I/O = Control Block	e.g., Network Architecture Node = Address Link = Protocol	e.g., Security Architecture People = Identity Work = Job	e.g., Timing Definition Time = Interrupt Cycle = Machine Cycle	e.g., Rule Specification End = Sub-condition Means = Step	DETAILED REPRESENTATIONS (out-of-context)
Subcontractor							Subcontractor
FUNCTIONING ENTERPRISE	e.g.: DATA	e.g.: FUNCTION	e.g.: NETWORK	e.g.: ORGANIZATION	e.g.: SCHEDULE	e.g.: STRATEGY	FUNCTIONING ENTERPRISE



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Summary